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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,426	08/15/2003	Kari Harkonen	11429/19:2	9896

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EXAMINER

CHEN, BRET P

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/642,426

Applicant(s)

HARKONEN ET AL.

Examiner

B. Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-14,16-65 and 69-78 is/are pending in the application.
- 4a) Of the above claim(s) 64,65 and 69 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14,16-63 and 70-78 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Claims 1-2, 4-14, 16-65, and 69-78 are pending in this application, which is an RCE of Serial Number 10/642,426. The amendments dated 2/21/06 and 2/22/06 have been entered. Amended claims 1, 11, 16-18, 29-30, 45, 58, 65, 70; canceled claims 3, 15, 66-68; and newly added claims 74-78 are noted. In addition, the status identifiers for claims 38-41 should be corrected in the next response.

Claims 64-65 have been withdrawn from consideration as being directed to a nonelected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 74-78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 74, the term “chemical genus” is deemed new matter as there is no support for the term “genus” in the specification as originally filed. This includes steps b) to f). The same issue applies to claims 75-76.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-14, 16-65, and 69-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elers et al. (6,482,262) alone or when taken in view of Iyer et al. (5,933,760) or Stutius (4,422,888) or Miller et al. (4,378,987). Elers discloses a method of depositing a transition metal carbide thin film by atomic layer deposition in which a transition metal source compound and a carbon source compound are alternatively provided to the substrate (col.2 lines 32-47). A substrate is placed in a reaction space at an elevated temperature for deposition (col.3 lines 24-26) such that adsorption occurs (col.3 lines 37-40). Between each insertion of gas, there is a purging step in which an inert gas is utilized to prevent gas phase reactions (col.3 line 55 – col.4 line 6). The transition material source can be metal halides and the carbon source can be a boron source compound (col.5 lines 7-67). The pulsing sequence can be repeated (col.4 lines 1-3). It is the examiner's position that since a metal carbide is formed, the chemical reacting recited in the new limitation is inherently met. However, the reference does not specifically teach that the chemical must be a organometallic material.

It is noted that the reference fairly teaches the use of organometallic materials as an appropriate source compound (col.5 line 7 – col.6 line 67). Given such a teaching, one skilled in the art would reasonably expect that the deposition would be fully successful with the use of any of the materials listed including organometallic materials. It would have been obvious to utilize

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an organometallic compound with the expectation of obtaining a successful deposition because Elers discloses that organometallic compounds can be used to achieve transition metal carbide films by atomic layer deposition.

In addition, Elers specifically discloses that the carbon source material can be a boron source compound, a silicon source compound, and a phosphorus source compound (col.5 lines 10-12) and specific examples such as triethylborane, tetraethylsilane, tetramethylsilane, triethylphosphine, triethylboron, tetraethylsilicon, tetramethylsilicon, and triethylphosphor are recited in Table 5. Iyer et al. (5,933,760), Stutius (4,422,888), and Miller et al. (4,378,987) have been cited to show that Elers exemplary materials are commonly referred to as organometallic materials, specifically tetramethylsilane (Miller col.6 lines 20-21), triethylphosphine (Stutius col.7 lines 5-8), and triethylborane (Iyer col.2 lines 14-16).

The limitations of claims 2-63 have been addressed above.

In claim 70, the applicant requires that the compound be provided in pulses. This limitation is met in col.2 lines 35 of Elers.

The limitations of claims 71-73 have been addressed above.

In newly added claims 74-78, the applicant requires the use of chemical genus. One skilled in the art would realize that if a specific chemical is taught, the class of materials it represents would be expected to behave similarly. Hence, it would have been obvious to utilize chemical genera with the expectation of obtaining similar results.

Response to Arguments

Applicant's arguments filed 2/21/06 have been fully considered but they are not persuasive.

Applicant argues that the reference fails to teach the carbon from the organometallic chemical reacts with the transition metal from the transition metal chemical to form a carbon and transition metal containing film (p.12).

The examiner disagrees. As noted above, since Elers teaches the formation of a transition metal carbide, it must inherently possess the claimed reaction.

Applicant argues that the reference teaches away from the use of a transition metal chemical and an organometallic chemical (p.12).

The examiner disagrees. It is the examiner's position that Elers teaches both as noted above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. Chen whose telephone number is (571) 272-1417. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Bc
3/3/06


BRET CHEN
PRIMARY EXAMINER